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Real or Illusory Growth in an Oil-Based Economy: Government Expenditures and Private Sector Investment in Saudi Arabia

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Summary. — The purpose of this paper is to determine whether and to what extent "Dutch Disease" effects have offset the potentially positive Hirschman-type inducements provided by massive government expenditures intended to stimulate private sector investment in Saudi Arabia. The main finding is that in Saudi Arabia at least infrastructure investment does not appear to have played a strong role in stimulating private sector investment. Instead, the private investors appear to be much more sensitive to shorter run current conditions created by government expenditures.

1. INTRODUCTION

Most of the major oil-exporting developing countries have relied to one extent or another on a variant of Hirschman's (1958) policy of unbalanced growth. This approach stresses the supply-side effects produced by massive investments in social overhead capital (Looney, 1989b). Since the 1973/74 oil price revolution Saudi Arabia, for example, has allocated approximately 375 billion riyals (RIs) to development infrastructure (during most of this period the exchange rate was around 3.5 RIs to the US dollar).

Given the extent of these expenditures, however, the economy's economic performance in recent years must be considered a major disappointment, with private investment falling in real terms each year since 1981/82. As documented and predicted in Auty's seminal work (1988a, 1988b, 1988c, 1989) industrial diversification has been somewhat disappointing.

A number of reasons for the country's current economic problems have been suggested (Looney, 1988c, 1990). Some are specific and relate to relative price movements associated with the Dutch Disease — the decline in profitability of traded goods stemming from an overvalued exchange rate created by the oil boom. In fact, there is increasing evidence of the existence of the Dutch Disease in Saudi Arabia (Looney, 1988/89).

Other explanations are more general and relate to the quality and composition of government expenditures. Finally, institutional factors such as restrictions on the earning of interest, have most likely encouraged commercial banks (and presumably private investors) to shift funds to foreign capital markets, particularly during periods of relatively high euro-interest rates (Wilson, 1982).

The purpose of this paper is to determine which of these factors have offset the potentially positive Hirschman-type inducements to private sector investment. Based on these findings, several policy implications are drawn. With this end in mind, the following section provides a brief overview of the government's development plans and expenditure patterns. Since the ultimate intent of government policy is to stimulate private sector activity, especially investment, the next section develops a private sector investment function, incorporating the stimulative effects of government expenditures together with variables depicting the possible offsets or negative effects associated with oil revenues and their use by the government.

2. DEVELOPMENT PLANS AND GOVERNMENT EXPENDITURES

Economic development policies in Saudi Arabia have been carried out since 1970s in a series

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of five-year plans. These plans set physical infrastructural targets and provide an overall spending framework. The Second Development Plan's (1975–80) main objectives were to maintain a high rate of economic growth, reduce dependence on oil, develop indigenous human resources, and develop physical infrastructure.

The Third and Fourth plans maintained these central goals, but elaborated on certain specifics. The Third Plan, for instance, placed particular emphasis on restraining growth of the expatriate labor force and on promoting growth in agriculture, industry and mining. Because of the anticipated greater involvement of the private sector in economic development during the Fourth Plan, the planning authorities adopted a new methodology that concentrated on programs and policies rather than specific projects and targets (Economist Intelligence Unit, 1988, pp. 112–113).

On the expenditure side, the striking pattern characterizing Saudi Arabia's development has been the rapid expansion of government expenditures (Looney and Frederiksen, 1988). In particular, government investment as a percentage of total investment increased from slightly under 7% in 1960 to 42.9% in 1965, 53.3% in 1970, and 72.6% in 1980. The public sector's share in investment declined somewhat to around 55% in the late 1980s. Similarly, public sector consumption increased from slightly over 20% of total consumption in 1960 to 36.5% in 1965, 46.9% in 1975, 43.1% in 1980, and to around 45% in the late 1980s. The net result of these trends is that the expenditures of the public sector have risen as a percentage of total expenditures from around 20% in 1960 to slightly under 50% in the late 1980s.

While the 1970s were characterized by a government investment boom, there has been a steady downgrading of spending on infrastructure in the 1980s. In part this trend reflects the completion of many of the major infrastructural projects begun after the start of the oil boom. It is also indicative, however, of the general decline in oil revenues after 1982 and the manner in which the government has managed austerity (Looney 1991).

3. DETERMINANTS OF SAUDI ARABIAN PRIVATE INVESTMENT

Much of the existing literature (Blejer and Khan, 1984; Tun Wai and Wong, 1982) on private sector investment in developing countries argues that public investment involves both the development of infrastructure which would probably be complementary with private investment, and other types of consumption and noninfrastructural investment which may compete with private investment either through absorbing limited physical resources or through the production of marketable output. In the aggregate, the effects of the infrastructural and noninfrastructural components can offset each other, thereby yielding the impression that the impact of total government investment on the level of private investment is weak or insignificant.

Blejer and Khan (1985) have, however, shown that once the two aspects of public sector investment are recognized and a distinction is made along functional lines involving infrastructural and noninfrastructural investment and consumption, considerably stronger statements can be made of the role of government in private capital formation. Following Blejer and Khan, the model developed below attempts to capture some of the institutional and structural characteristics of the Saudi Arabian economy. Suffice to say that a number of problems (Abdeen and Shook, 1984) tend to limit the applicability of a strict version of the neoclassical investment model set forth by Jorgenson (1967, 1971).

As a starting point, it is reasonable to assume that private investors in Saudi Arabia undertake investment to bridge the gap between their actual capital stocks and perceived optimal levels. Following Blejer and Kahn the process takes place as follows:

$$DIP\ (t) = b\ [IP\bigstar\ (t) - IP\ (t-1)]. \qquad \text{(a)}$$

Where $IP\bigstar$ is the desired level of gross private investment; IP is the actual level of gross private investment; b is the coefficient of adjustment with b greater than or equal to zero and less than or equal to one, and D is a difference operator in the steady state. The desired rate of gross private investment can be related to the desired stock of private capital $KP\bigstar$ in the following manner:

$$IP\bigstar\ (t) = [1 - (1-z)\ L]\ KP\bigstar\ (t). \qquad \text{(b)}$$

Where z is the rate of depreciation and L is a lag operator — $LKP\ (t) = KP\ (t-1)$.

In the long run, the desired stock of capital is assumed to be a function of lagged real output, $YR\ (t-1)$, and/or real oil revenues $OIL\ (t)$.

$$KP\bigstar\ (t) = a\ [YR\ (t-1),\ OIL\ (t)]. \qquad \text{(c)}$$

Combining equations $a - c$ and solving for $IP\ (t)$ yields the basic dynamic accelerator function:

$$IP\ (t) = [1 - (1-z)\ L]\ ba\ Y\ (t-1),\ OIL\ (t) + (1-b)\ IP\ (t-1). \qquad \text{(d)}$$

As to the role of public investment and other

factors in the rate of private capital formation, we hypothesize that the response of gross private investment to the gap between desired and actual investment, as measured by b in equation (a) is not a fixed parameter, but rather varies systematically with economic factors that influence the ability and willingness of private investors to achieve the desired level of investment.

Here the ability of the private sector to respond depends on two main factors: first, the availability of financing, and second, the level of public sector investment. Finally, expectations of future economic conditions, and the attractiveness of alternative uses for investment funds determine the short-run willingness to bridge the gap between actual and optimal capital stocks.

As for credit, in recent years a clear consensus has emerged that, in contrast to the case of industrial economies, one of the principal constraints on investment in developing countries is the quantity of financial resources rather than their costs. The rudimentary nature of capital markets in Saudi Arabia, however, limits the financing of private investment to the use of retained profits, bank credit and, in particular, government subsidies. An increase in real credit to the private sector will, other things being equal, directly encourage real private sector investment, and by rolling over bank loans, the maturity of debt can be lengthened sufficiently to correspond to the length of the investment project.

In terms of government investment, increased infrastructure (*á la* Hirschman's unbalanced growth strategy) should, through reducing the cost of private sector production, increase the profitability of directly productive activity (DPA) and hence private investment. On the other hand, increased pessimism about future economic conditions, and/or attractiveness of foreign investment possibilities would tend to reduce the willingness of private invetors to divert investment toward domestic projects. In addition, there is considerable evidence that Saudi banks increase holdings of foreign assets during periods of high real euro-interest rates (Looney, 1987). *Ceteris paribus*, relatively high real euro-rates should most likely divert funds away from domestic capital formation.

As noted earlier, recent analysis (Looney, 1988/89) of sectoral growth rates has confirmed the presence in Saudi Arabia of the so-called Dutch Disease. This phenomenon operates through the overvaluation of the exchange rate brought about by the increase in price of nontradables relative to tradables following stepped up levels of oil-financed government expenditures. The increase in relative profitability of nontradables enables these activities to bid resources (both actual and potential) from tradable activities — mainly agriculture and manufacturing.

Using a three-sector model with the booming sector (oil), nontraded goods and traded goods sectors, Kamas (1986, p. 1178) has summarized the effects of the primary export boom: the increased profitability in the booming export sector pulls resources out of the other traded and nontraded sectors, causing output to decline, while higher spending (along with the resource movement) increases the relative price of nontraded goods, pulling resources from both the booming sector and the other traded-goods sectors. There is an unambiguous decline in the other traded-goods sector while the net effect on output in the nontraded and the booming sectors are indeterminate. While the overall trade balance is back to zero in the final equilibrium, net exports of the other traded-goods sectors fall while consumption increases. This effect has received less emphasis in the literature than the deindustrialization effect, yet it represents an increased dependence on the primary export at the expense of manufactured or other nonbooming sectors. Clearly this is undesirable from the perspective of Saudi Arabia's economic diversification objectives.

As Kamas (1986, p. 1178) notes diagnostic tests for the Dutch Disease should look for the following symptoms: (a) an increase in the relative price of nontraded goods or an appreciation of the real exchange rate; (b) a decline in output in nonbooming tradable goods and a very likely increase in nontraded production and (c) a decline in exports on nonbooming traded goods.

Unfortunately the data on Saudi Arabian private sector investment are not broken down by tradable/nontradable activities. Given this fact, it is impossible to specify *á priori* a sign for increases in the real exchange rate in the equation for private sector investment. Instead, we simply assume (as is very likely) that the great bulk of private sector investment was in tradables. On the assumption of limited possibilities for investment in nontradables, exchange rate appreciation should, *ceteris paribus*, reduce the rate of increase in private capital formation from what it might otherwise have been.

To summarize, on the basis of the arguments above, we can express the coefficient of adjustment in equation (a) as a function of the change in subsidized real bank credit, infrastructure development, Dutch Disease factors, the profitability of foreign investment, and expectations of the profitability of domestic investment.

$$b(t) = b0 + 1/x\star\ [b1\ ICR(t) + b2\ GI(t) + b3\ REX(t) - b4\ EUROR(t) + b4\ INFE(t)]. \quad (e)$$

Where: $x\star = IP\star(t) - IP(t-1)$, *ICR* = the real level of subsidized credit provided to industry by the Saudi Industrial Development Fund (Johany, Berne and Mixon, 1986, chapter 13). *GI*, the level of real government investment, *REX*, the real Riyal/dollar exchange rate (computed as the nominal exchange rate times the import price index, divided by the nonoil GDP deflator). On the assumption that the great bulk of Saudi Arabian private investment was in tradables its expected sign is positive (since larger values reflect a weaker real Saudi Riyal). *EUROR* is the real euro-rate of interest (defined as the euro-dollar rate in London — line 60d in International Monetary Fund, *International Financial Statistics* minus the annual rate of change in export prices of the advanced industrial countries). Finally, expectations concerning the profitability of domestic investment, *INFE* are proxied by the expected rate of domestic inflation. Expected inflation was estimated from the equation:

$$INFE(t = a + b\ [INF(t-1)].$$

Where *INF* = the expected nonoil GDP price deflator, and *INF* = the nonoil GDP price deflator.

Equation (e) states that the response of private investment depends on the magnitude of these factors measured in relative terms with respect to the size of the discrepancy between desired and actual investment,

$$[IP\star(t) - IP(t-1)].$$

Substituting equation (e) into equation (a) yields:

$$IP(t) = b0\ (IP\star(t) - IP(t-1)] + b1\ ICR(t) + b2\ GI(t) + b3\ REX(t) - b4\ EURO(t) + b5\ INFE(t). \quad (f)$$

Since from equations (b) and (c) we show that:

$$IP\star(t) = b0a\ [YR(t-1) - (1-c)\ YR(t-2)] + b1\ ICR(t) + b2\ GI(t) + b3\ REX - b4\ EURO(t) + b5\ INFE(t) + (1-b0)\ IP(t-1).$$

We can now derive a dynamic reduced from equation for gross private investment:

$$IP(t) = b0a\ [YR(t-1) - (1-c)\ YR(t-2)] + b1\ ICR(t) + b2\ GI(t) + b3\ REX(t) - b4\ EURO(t) + b5\ INFE(t) + (1-b0)\ IP(t-1). \quad (g)$$

This equation can be extended to make the coefficient of adjustment, $b(t)$ depend on both the level (*GI*) and the change in public sector investment (*DGI*). This yields:

$$IP(t) = b0a\ [YR(t-1) - (1-c)\ YR(t-2)] + b1\ ICR(t) + b2\ GI(t) + b3\ REX(t) - b4\ EURO(t) + b5\ INFE(t) + b6\ DGI(t) + (1-b0)\ IP(t-1). \quad (h)$$

The direct effects of government policy on private investment can be obtained from the estimates of *b*1 and *b*2 (and *b*6 in equation h), while indirect effects are represented by *b*3, *b*4 and *b*5.

4. EMPIRICAL RESULTS

Preliminary estimates[1] using a shortened version of this model, however, indicated that private sector investment is insensitive to changes in real nonoil GDP[2]:

$$IP = \underset{(17.57)}{0.98\ IPL} + \underset{(0.07)}{0.06\ DYL} + \underset{(2.53)}{0.14\ ICR} - \underset{(-2.03)}{0.41\ RHO}$$

$$r^2 = 0.980;\ F = 262.29;\ DW = 1.90. \quad (1)$$

Where *DYL* is the accelerator $[Y(t-1) - Y(t-2)]$ with Y = real nonoil *GDP*; $IPL = IP(t-1)$.

Substituting real oil revenues for the simple accelerator yielded:

$$IP = \underset{(17.15)}{0.87\ IPL} + \underset{(3.02)}{0.31\ OIL} + \underset{(2.04)}{0.08\ ICR} - \underset{(-2.39)}{0.47\ RHO}$$

$$r^2 = 0.998;\ F = 448.60;\ DW = 1.91. \quad (2)$$

It appears from equation (1) that private investment in Saudi Arabia experiences a strong Koyck (1954) distributed lag. This is apparent from the statistical significance of the lagged (*IPL*) private investment term. Distributed lags are a common phenomena in Saudi Arabia, and in large part reflect adjustments to oil shocks (Looney, 1984), with investment expanding and contracting over time to sharper changes in oil revenues and subsidized credit.

This pattern does not hold true, however, when expanding estimation to the full model:

$$IP = \underset{(0.54)}{0.11\ IPL} + \underset{(7.24)}{0.56\ OIL} + \underset{(6.85)}{0.17\ ICR} - \underset{(-8.13)}{0.30\ GI} + \underset{(3.77)}{1.43\ REX} - \underset{(-2.94)}{0.99\ EURO} + \underset{(7.97)}{1.49\ INFE} - \underset{(-6.86)}{0.84\ RHO}$$

$r^2 = 0.999$; F = 2294.15; DW = 1.78. (3)

Adding the change in government investment (*DGI*):

$$IP = \underset{(0.95)}{0.11\ IPL} - \underset{(8.00)}{0.56\ OIL} + \underset{(7.78)}{0.17\ ICR} - \underset{(-6.96)}{0.39\ GI} + \underset{(4.10)}{2.18\ REX} - \underset{(-3.51)}{0.10\ EURO} + \underset{(7.48)}{1.81\ INFE} + \underset{(1.83)}{0.05\ DGI} - \underset{(-8.21)}{0.88\ RHO}$$

$r^2 = 0.999$; F = 2495.65; DW = 2.12. (4)

Several interesting patterns emerge from equations (3) and (4). First, when all the relevant variables are accounted for and introduced into the private investment equation, the distributed lag adjustment pattern is no longer significant (evidenced by the low *t* statistic on lagged private sector investment, *IPL*). Second, contrary to expectations, massive increases in infrastructure have not stimulated private investment. Furthermore, there is only a very weak link between changes in government investment, *DGI*, and private investment. Third, Dutch Disease effects (as proxied by the appreciation of the real exchange rate) do appear to be present in Saudi Arabia, retarding over time the expansion of private sector investment. Fourth, consistent with the analysis of commercial bank foreign assets (estimated equations (3) and (4) above), high external rates of return divert investment funds into foreign assets. Fifth, expectations of future profitability appear to have a significant impact on the private sector's decision to invest domestically. In addition to expected inflation, several other variables: (a) expected increase in nonoil GDP, and (b) expected government consumption expenditures were tested as proxies for expected future profitability of domestic investment. None of these variables, however, were statistically significant.

Given the fact that infrastructure investment has been the cornerstone of Saudi Arabia's development strategy, and the widespread belief in the kingdom that public sector investment plays a relatively important role in private capital formation, the results obtained above are certainly surprising. One explanation may lie in the use of real government investment as a proxy for the state's investment in infrastructure. This figure comprises both infrastructural and noninfrastructural components of public investment. It is quite possible that each of these elements affects private investment in fundamentally different ways, causing them to offset one another (for example, absorptive capacity problems associated with the noninfrastructural component raising costs of labor, and the like sufficiently to neutralize any cost reductions associated with the infrastructural component).

Clearly, it would be more meaningful to separate and estimate the independent effects of the different categories of public investment. Unfortunately the government does not publish data at this level of disaggregation.

One way of getting around this problem is to develop alternative proxies for infrastructural and noninfrastructural components. The basic assumption underlying these proxies is that infrastructure investment, especially in areas such as transport, is an ongoing process that moves slowly over time and cannot be changed very rapidly. The first of the two approaches takes the trend level of real public sector investment (*GILT*) as representing the long-term or infrastructural component and argues that this should have a positive effect on gross real private investment; deviations from the trend (*GIDLT*) are assumed to represent noninfrastructural investment.

A final factor that needs to be taken into account is the potential problem of real or physical crowding out (Looney and Frederiksen, 1987). It is a well-accepted proposition that in Saudi Arabia absorptive capacity has been a problem, particularly in the early oil boom years. By definition, public sector expenditure can result in crowding out if it utilizes physical and financial resources that would otherwise go to the private sector. Furthermore, the financing of public sector investment, whether through taxes, issuance of debt or inflation will lower the resources available for the private sector and thus depress private investment activity. These effects should not be a major factor in Saudi Arabia, however, given the government's resource base, lack of debt and inflation. Operationally, a negative sign on the noninfrastructural term, $GIDLT\ [GI\ (t) - GILT\ (t)]$, can be assumed to reflect crowding out of private sector investment due to excessive allocations to noninfrastructural uses.

Finally, because of the apparent responsiveness of the private sector to increases in credit, the expected level of commerical bank credit (divided in a manner similar to that described above for expected inflation) CRE, was included in the regression equation.[3] Adding the Dutch Disease and foreign rates of return yielded:

$$IPP = \underset{(2.18)}{0.47\ CRE} + \underset{(7.20)}{0.64\ OIL} + \underset{(3.84)}{0.15\ ICR} - \underset{(-3.28)}{0.22\ GILT} - \underset{(-4.41)}{0.28\ GIDLT} + \underset{(2.24)}{0.62\ INFE} - \underset{(-4.16)}{0.69\ RHO}$$

$r^2 = 0.9983$; F = 983.27; DW = 1.86 (5)

$$IPP = \underset{(1.11)}{0.20}\,CRE + \underset{(5.50)}{0.46}\,OIL + \underset{(5.27)}{0.16}\,ICR - \underset{(-5.62)}{0.32}\,GILT - \underset{(-3.13)}{0.17}\,GIDLT + \underset{(4.42)}{1.60}\,INFE + \underset{(3.32)}{2.30}\,REX - \underset{(-6.00)}{0.80}\,RHO$$

$r^2 = 0.998$; F = 1673.39; DW = 2.07 (6)

$$IPP = \underset{(0.66)}{0.10}\,CRE + \underset{(7.35)}{0.56}\,OIL + \underset{(5.54)}{0.14}\,ICR - \underset{(-7.44)}{0.35}\,GILT - \underset{(-4.66)}{0.24}\,GIDLT + \underset{(5.73)}{1.66}\,INFE + \underset{(3.40)}{1.94}\,REX - \underset{(-2.62)}{0.86}\,EURO - \underset{(-7.81)}{0.87}\,RHO$$

$r^2 = 0.999$; F = 2317.63; DW = 2.03 (7)

A variant on this approach is to make a distinction between types of public investment on the basis of whether investment is expected (again, calculated in a manner similar to the expected values noted above). Here it is assumed that expected public investment, *GIE*, represents allocations of public investment for intrastructure, while unanticipated public investment, *GIU*, is assumed to be the difference between actual expenditures and expected expenditures, and represents the noninfrastructural component of public investment. Here it is assumed that a negative sign on the unanticipated public investment expenditures term is indicative of real crowding out. The results:

$$IPP = \underset{(2.60)}{0.52}\,CRE + \underset{(9.28)}{0.70}\,OIL + \underset{(3.92)}{0.11}\,ICR - \underset{(-5.32)}{0.27}\,GIE - \underset{(-2.39)}{0.18}\,GIU + \underset{(2.50)}{0.67}\,INFE - \underset{(-4.36)}{0.70}\,RHO$$

$r^2 = 0.998$; F = 1062.39; DW = 1.70 (8)

$$IPP = \underset{(1.41)}{0.26}\,CRE + \underset{(5.93)}{0.51}\,OIL + \underset{(5.78)}{0.16}\,ICR - \underset{(-6.94)}{0.27}\,GIE - \underset{(2.83)}{0.17}\,GIU + \underset{(4.38)}{1.26}\,INFE + \underset{(3.03)}{1.51}\,REX - \underset{(-5.38)}{0.76}\,RHO$$

$r^2 = 0.998$; F = 1600.39; DW = 1.88 (9)

$$IPP = \underset{(0.91)}{0.14}\,CRE - \underset{(7.76)}{0.59}\,OIL + \underset{(5.89)}{0.14}\,ICR - \underset{(-8.77)}{0.31}\,GIE - \underset{(-4.20)}{0.24}\,GIU + \underset{(5.77)}{1.41}\,INFE + \underset{(3.34)}{1.36}\,REX - \underset{(-2.52)}{0.86}\,EURO - \underset{(-7.19)}{0.84}\,RHO$$

$r^2 = 0.999$; F = 2186.54; DW = 1.72 (10)

Again the results obtained for the impact of infrastructural investment on private sector investment are somewhat surprising. It appears that the infrastructure component of government investment (expected government investment) has had a negative impact on private sector capital formation. Unexpected increases in government investment or deviations from the long-run trend in public investment (the noninfrastructural components) may also have resulted in some real crowding out of private sector investment. Capital flight and the Dutch Disease effects were also important in reducing domestic private capital formation.

As noted, in recent years government consumption has been increasing it share in total public sector expenditures. Particularly since the 1982 oil price declines, the government appears to be shifting toward shorter run programs and away from the massive infrastructural investments of the late 1970s. Has this switch done anything to affect the private sector perception of future rates of return on domestic investment? To test for the effect of government consumption, the expected level of real government consumption, *GCE*, was introduced into the regression equation. The result:

$$IPP = \underset{(1.07)}{0.22}\,CRE + \underset{(7.34)}{0.67}\,OIL + \underset{(2.75)}{0.10}\,ICR - \underset{(-4.52)}{0.19}\,GIE + \underset{(3.02)}{0.70}\,INFE + \underset{(1.37)}{0.98}\,REX - \underset{(-1.77)}{0.35}\,EURO + \underset{(3.35)}{0.10}\,GCE - \underset{(-4.49)}{0.70}\,RHO$$

$r^2 = 0.998$; F = 1184.10; DW = 1.87 (11)

Dropping expected commercial bank credit:

$$IPP = \underset{(6.94)}{0.66}\,OIL + \underset{(2.62)}{0.16}\,ICR - \underset{(-4.83)}{0.21}\,GIE + \underset{(4.61)}{0.86}\,INFE + \underset{(1.24)}{0.90}\,REX - \underset{(-1.95)}{0.40}\,EURO + \underset{(5.79)}{0.13}\,GCE - \underset{(-3.21)}{0.55}\,RHO$$

$r^2 = 0.998$; F = 1175.95; DW = 1.90 (12)

5. IMPLICATIONS

Apparently, the Saudi private sector responds more to shorter run stimuli than longer term advantages provided by infrastructure. Expected government consumption, inflation, oil revenues and subsidized credit all exert a positive and highly significant effect on private investors. To a certain extent, however, this stimulus is offset by government investment preempting resources

from the private sector, together with fairly weak Dutch Disease and capital flight effects.

In sum, infrastructure investment does not appear to have played a strong role in stimulating private sector investment as predicted by Hirschman. Instead the private investors appear to be much more sensitive to shorter run current conditions created by government expenditures, i.e., investors apparently need a steady infusion of subsidies and/or direct incentives to sustain their enthusiasm for domestic capital formation. Evidently, if these are not forthcoming, the private sector is inclined to shift their wealth into foreign assets. This pattern is, of course, reinforced during periods of rising euro-interest rates. It seems that the potential supply-side cost reductions associated with infrastructural investment, the cornerstone of Saudi Arabia's free market development strategy, are either too subtle or insufficient in this environment to attract follow-on domestic investments.

6. CONCLUSIONS

Many of the problems currently faced by the mineral/oil developing country exporters stem from the inability of their governments to effectively "sow the oil" for the purposes of creating a viable and dynamic nonoil sector. As Gelb's (1986, 1988) research has shown, the record so far suggests that for this group of countries, the benefits have been far smaller than expected. According to Gelb's findings (1986, pp. 28–29) this has come about partly because of the increased uncertainty which accompanied the windfall, partly due to the asymmetry of macroeconomic adjustments, and partly to the low quality of much public capital formation.

The results obtained above are in broad agreement with Gelb's analysis. They are also consistent with those of Auty (1989a, 1988b, 1988c, 1989) whose analysis provides another dimension of the industrial diversification problem in oil-exporting states. In this regard, the findings presented here contain both optimistic and pessimistic implications for the Saudi economy over the next few years of slack oil revenues. First, the results indicate that the private sector is reponsive to government initiatives. In particular, government consumption (presumably that including a subsidy element) can, given existing levels of infrastructure, stimulate further private sector investments. In this sense the recent shift in the composition of government expenditures away from investment and toward consumption may have been a wise decision. In any case, given the extremely high cost of infrastructure, the government may, by increasing the share of expenditures going to consumption, have found a cost-effective way of stimulating the private sector to pick up some of the slack associated with overall reduced levels of government expenditure.

On the other hand, while not conclusive because of the lack of private sector investment data by sector (tradables vs nontradables) the above findings are consistent with the conditions predicted by a growing body of literature on Dutch Disease (Corden, 1984; Roemer, 1985; Neary and van Wijnbergen, 1986; Kamas, 1986; Parvin and Dezhbakhsh, 1988; and al-Sabah, 1988). Summarizing much of this literature, Lewis (1984) notes that oil-financed government expenditures create, in addition to the exchange and interest distinctions noted above, an environment whereby:

(a) There is a natural relaxation of discipline by the government in overall fiscal matters.
(b) Government officials attempting to utilize the additional resources productively, move increasingly toward large-scale capital-intensive, long-gestation projects which utilize large lumps of available capital.
(c) The push to spend resources coupled with the limited capacity of the government to manage large programs leads to wasteful and poorly conceived projects.
(d) The government, because it has been unable to absorb enough of the new surplus in public sector projects, attempts to channel resources to the private sector, yet the government is ill-suited to serve as a financial intermediary.
(e) The private sector has been less able to respond because the government's own growth has crowded out private firms' access to scarce managerial and technical skills.
(f) Private investors become infected with a retainer ethos, demanding quick high returns on investment and unless directly subsidized, concentrate their resources on speculative ventures (property), rather than directly productive plant and equipment (*DPA*).

Clearly many of these conditions appear to be present to some degree in Saudi Arabia. While it is impossible at this time to determine precise magnitudes of the various factors discouraging private sector investment, their simple presence suggests that the country's economic future may not be as assured as was felt only a few years ago.

More specifically, the results obtained above suggest that Saudi Arabia's growth may not be sustainable and may in fact be largely an illusion.

Real development can only be achieved out of rate of *DPA* which is sustainable. If in fact private investment in *DPA* in Saudi Arabia has only been stimulated by short-run (and continuous) subsidies rather than the longer run supply-side incentives provided by the government's massive provision of infrastructure, and even worse if the oil sector somehow undermines the country's ability to produce *DPA*, then there are serious doubts about the long-term development prospects of the Kingdom.

NOTES

1. Data covering 1960–88 were used in the estimations. Exchange rates, interest rates, and domestic credit futures are from the IMF (various issues). Data for 1960–63 are from Al-Bashir (1977). All other data are from SAMA (various issues). The SAMA and IMF series were extended from 1964 back to 1960 by applying the growth rates in the respective variables found in Bashir's data set.

Annual data rather than quarterly data were used in the estimations. In part this stemmed from difficulties in reconciling data from the different sources. Specifically Saudi Arabia follows the lunar calendar with 12 months, but its year is 11 days shorter than the Gregorian calendar year. There are procedures which allow for transformation of the Hijra-year statistics into Gregorian-year statistics. Seasonal variations in Saudi Arabia, however, are largely related to religious observances — such as Ramadan, which occurs in the same month each year in the Hijra calendar, but which may shift from summer to winter when converted to the Gregorian calendar. The standard seasonal adjustment programs have difficulty dealing with such "floating" seasonals. In addition, seasonal dummies cannot be used in the nonseasonally adjusted data because seasonal changes move from year to year when translated in to the Gregorian calendar.

Nominal values were converted to constant price values by deflating with the nonoil GDP deflator presented in the SAMA (various issues). The consumer price index was not used for this purpose because it contains a number of price-controlled items.

There are several conceptual problems with the Saudi Arabian national income accounts that could not be reconciled here. First, oil revenues are effectively double counted (Barker, 1982, pp. 3–4), with the value added in this sector occurring once in its own right under "Mining and Quarrying" and again through the government sector whenever government expenditures which are almost totally funded from oil revenues, are made for domestic goods or services. This problem was largely avoided through the use of nonoil GDP in the regression equation.

Because of this characteristic of the National Income Accounts there has been a tendency for directly productive nonoil activities and investment to expand alongside the explosion in oil. Clearly one needs ultimately to deal with the issue of "real" versus "subsidized" output of directly productive activities. As Stauffer (1985) has noted that much of the observed expansion in nonoil directly productive activity (*DPA*) has been the result of heavy subsidization of inputs (paid for by oil revenues) and/or the creation of artificial markets for the output (i.e. bought with oil revenues). The results presented here indicate that the Dutch Disease effects are still strong enough to overcome these biases in the data. Put differently, in a strict sense the data are not adequate to assess the extent of positive impacts of oil revenues on the economy; however, they are adequate for arriving at conclusions as to the possible existence of the Dutch Disease.

2. Estimates were made using a Cochrane-Orcutt Autocorrelation technique to correct for first-order autocorrelation in the disturbances. The correction term, *RHO*, is presented in the equations with its t statistic. See Sorites Group (1989) and the references cited there for a description of this estimation procedure.

3. As can be seen from the change in the size of the regression coefficients as variables are added to the regression equations, there is some correlation among the independent variables. In selecting independent variables we used the rules of acceptable correlation developed by Klein (1965). Because of unacceptability high levels of correlation between the different types of government expenditures — investment and consumption — only one set of expenditures could be included in the regression equation at any one time (the reason, for example, why the government investment terms do not appear in equation 11).

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